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Original Research Article

Relationship between pseudo exfoliation syndrome of pupil and increased intraocular pressure and glaucoma in patients referred to ophthalmology clinic of Ardabil city hospital

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ABSTRACT

Background: Pseudo exfoliation syndrome (PXS) widely in world occurred with various prevalence rate and its risk factor has main role in rising IOP and glaucoma. The aim of this study was to evaluate the relationship between PXS and its associations with elevation of IOP/Glaucoma.
Methods: This is a cohort study that has been done on 144 patients of aged 50 and older referred to clinic of ophthalmology which was examined to the PXS depositions. PXS was diagnosed by slit lamp and a control group select matching with case group without PXS. All patients underwent a comprehensive ophthalmic evaluation by slit lamp and dilated pupil fundus for visual acuity, refraction, Tonometry and Gonioscopy.
Results: Out of 144 eyes of control group, 112 (77.8%) had PXS depositions. There was a significant increase in number of PXS involved eyes with age and the frequency of disease in men was higher than women. Out of 72 patients, 40 (55.5%) patients were bilaterally and 32 (44.5%) patients were unilaterally involved. The mean of IOP in eyes with PXS with 17.9±8.9 was significantly higher than eyes without PXS with 14.5±2.9.
Conclusions: PXS sediments are an important risk factor for increased IOP and glaucoma in our area and patients with PXS should be followed in term of IOP.

Keywords: Cataract, IOP, PXS

INTRODUCTION

Pseudo exfoliation syndrome (PXS) is characterized with distinct deposition of fibrillar materials in the anterior segment of the eye and it was described firstly by "Lindberg" for the first time in 1917. PXS is often associated with open-angle glaucoma and, in spite of extensive research; the exact chemical nature of fibrillar materials has not been specified yet. The shell-like sediments can be seen on the anterior surface of the lens, ciliary processes, zonular, the posterior surface of the iris and the trabecular network. PXS is a disease with worldwide diffusion and geographical and environmental changes and life in the different heights have a significant impact on its prevalence. The disease usually occurs in people over 65 years and is very common in the Nordic countries.[1]

Probably Pseudo exfoliation syndrome (PXS) is a systemic disorder and is associated with coronary artery disease and myocardial infarction, systemic hypertension and stroke. In addition to glaucoma, PXS has much association with cataract and because of zonular weakness in patients with PXS, cataract surgery is associated with more complications among them.[1]

Few studies have been conducted to assess the exact prevalence of PXS in the world, especially in Iran and considering the importance of PXS sediments in raising the intraocular pressure and glaucoma, that is associated

with an increased risk of permanent blindness, determining the rate of PXS risk factor in glaucoma establishment is essential.[2] Probability of leading PXS to glaucoma varies widely so that in a period of 10 years it varies up to 40%. This syndrome is strongly dependent on age and rarely occurs under 50 years of age and often occurs in people over 70 years.[3] This study aimed to investigate the relationship between high IOP or glaucoma and PXS in patients referring to Ardabil city hospital.

METHODS

The study was a cohort study. The study population included the patients over 50 years old referring to ophthalmology clinic of Ardabil Alavi hospital and were examined according to the study inclusion criteria and, based on the presence or absence of PXS sediment, were divided into two groups. The patients underwent thorough eye examination and medical history and the information related to visual acuity, measurement of IOP, and examination of the anterior pole of the eyeball by slit-lamp in terms of cataract were recorded for all patients by examination of an ophthalmologist. After signing the informed consent, the patients were enrolled. The data were analyzed in SPSS.16 using statistical methods.

RESULTS

The mean age of the patients was 70/9±8/8 years and the mean age of the two groups was similar. 70 (48/6%) of the total patients, 24 (34/3%) of the control group and 46 (65/7%) of the case group were male, and the number of male patients in the case group was significantly more than the control group. (P=0/001) The number of people having PXS in age group above 70 years in the case group was higher than other age groups. Compared to the control group, 18/1% of the cases in the right eye and 16/5% in the left eye had significantly IOP higher than normal. The mean IOP in both left and right eyes in the case group was significantly more than the control group.

Table 1: Compare the IOP between two groups.

Groups	Min IOP	Max IOP	Mean	N (eyes)
Eyes with PXS in case group	8	60	17.9	112
Eyes without PXS in case group	8	19	14.1	32
Eyes in control groups	9	21	14.6	144
Eyes without PXS in both groups	8	21	14.5	176

Of 144 eyes in the case group, 112 (77.8%) eyes were with PXS and 32 (22.2%) eyes had no sediment, and among all patients, 176 eyes (61/1%) were without PXS sediment. The mean IOP in eyes with PXS in the case group was 17.9±8.9 and in total eyes without PXS in both groups was 14.5±14/512.9 mm Hg and the difference between two groups was significant (Table 1). A total of 32 eyes in the case group were treated with IOP-lowering inside eye drops. Of the 32 eyes, two patients were without PXS and 30 cases with PXS.

Table 2: IOP condition in eyes with PXS.

Groups	Min IOP	Max IOP	Mean	N (eyes)
Glaucoma in eyes with PXS	11	60	22.4±2.1	30
Glaucoma in eyes with PXS with normal IOP	11	20	15.6±3.1	19
Glaucoma in eyes with PXS with high IOP	22	60	33.7±3.1	11
Non diagnosed high IOP in eyes with PXS	22	50	29.4±2.4	13
Normal IOP in eyes with PXS (with use and without use eye drop)	8	21	14.2±0.3	87

2 cases in the control group were treated with IOP-lowering inside eye drops. The difference between IOP in patients with known glaucoma and the patients who had no history of eye drops usage was significant. Of 112 eyes with PXS, 30 (26/8%) eyes had a known glaucoma in which mean of IOP was 22.4±2.1 among them. The difference between two groups in terms of developing glaucoma or high IOP was significant (Table 2).

Table 3: Compare cataract prevalence in all eyes.

Cataract type	Cases			
	Number			%
	Total	With PXS	Without PXS	
PSC	105	49	56	36.5
Cataract antinuclear	63	31	32	21.9
Cataract cortical	116	49	67	40.3
Reached cataract	2	2	0	0.7
Very reached cataract	1	0	1	0.3

The most of suffering place were the edge of the pupil and anterior chamber angle PSI, respectively, each with 112 eyes (77.8%). Among all eyes examined in both case and control groups (288 eyes), 105 (36/5%) eyes were with posterior capsular cataract subtype (PSC) that 56 (53/3%) cases were without PXS eyes and 49 (46/7%)

seen with PXS. Among this group (PSC), 60% had mild, 25/7% with moderate and 14/3% were severe degree (Table 3). There was no significant difference in the incidence of cataract, hypertension, heart disease and underlying medical condition in the eyes with PXS and without PXS (Table 4).

Table 4: Underlying medical conditions in two groups.

Diseases groups	HTN N (%)	Diabetic N(%)	Heart disease N (%)	Others N (%)
Case	19 (26.4)	6 (8.3)	9 (12.5)	7 (9.7)
Control	26 (36.1)	16 (22.2)	14 (19.4)	5 (6.9)
Total	45 (31.2)	22 (15.3)	23 (16)	12 (8.3)

Table 5: Type of visual acuity in two groups after correction.

Groups	Case		Control	
Type of visual acuity	n	%	n	%
NLP	8	5.6	0	0
HM+NLP	4	2.8	8	5.6
FC	19	13.2	12	8.3
1/10-5/10 after correction	50	34.7	45	31.3
>5/10 after correction	63	43.8	79	54.9

In both case and control groups the most prevalent visual acuity related to sight was after correction higher than 5/10 and there was no significant differences between the two groups in terms of visual acuity (Table 5).

Table 6: Prevalence of C/D ratio in two groups.

C/D ratio	Case N (%)	Control N (%)
≤3/10	116 (80.6)	126 (87.5)
3/10-5/10	9 (6.3)	9 (6.3)
>5/10	14 (9.7)	3 (2.1)
Non visible	5 (3.5)	6 (4.2)
Total	144 (100)	144 (100)

There was a significant difference between the two groups in the C / D ratio of higher than 5/10 so that this ratio in case group was significantly higher than control group (Table 6).

DISCUSSION

Several studies have been conducted in the pupil pseudo exfoliation sediments, its prevalence and association with elevated IOP and or glaucoma, as well as its relationship with other systemic disorders and the prevalence of PXS in different parts of the world varies from 0.4% in China to 35.4% in Estonia.[4-17] In studies done in other places, the prevalence of PXS has been increased with age increasing that has been in line with the results of present study.[4-6,9,10,12-13,15,17] Different results obtained in previous studies in terms of the difference between the two sexes which sex difference has not been observed in some studies (Morano Montane study in Spain, Arvind H study in southern India, Susic N study in Croatia, but in some studies in line with this study, the disease is more common in women than in men (63/9% of men and 36/1% in women) which probably shows the different disease behaviors in present region and perhaps some other regions of the world.[4,9,13]

In terms of bilateral or unilateral, bilateral ocular involvement has been observed in most of the various studies.[4,5,8-10,13,15] In the present study, also, bilateral ocular involvement was seen in the majority of the cases (55/5% bilateral and 44/5% unilateral). In terms of suffering from cataract, in some studies it has been shown that the prevalence of antinuclear cataract is higher than the other types of cataract. Andhra Pradesh study in India and Junejo SA study in Pakistan, Young AL study in China, and a study by Kuldar Kaljurand in Estonia in 2004), while in the present study, the prevalence of cortical cataract was higher than other types (116 eyes, 40/3%), but the difference between the two groups was not significant.[15]

In all previous studies, in terms of intraocular pressure, the mean IOP in patients with PXS deposits was higher than the patients without PXS which was similar to our study results (17/94 against 14/51). However, any significant difference between mean IOP in eyes without PXS in the case group and all eyes in the control group was not observed. In terms of developing glaucoma or elevated intraocular pressure similar to previous studies significant differences between the two groups were observed (2 eyes in the control group and 43 eyes in the case group) that this difference is meaningful and this indicates that the presence of PXS is an important risk factor for glaucoma or elevated intraocular pressure.[5,7,9,12-18] In terms of C / D ratio above 5/10, the

increase in the case group is significant (P=0.021), which indicates a lack of proper screening of patients or lack of referring the patients to measure intraocular pressure and the correct follow up and considering that in case of loss of optic nerve disease (high ratio C / D) , glaucoma is not returnable, so planning and designing of health authorities to screen at risk people, especially in elderly, and in case of the presence PXS, is absolutely necessary.

CONCLUSION

The results showed that the prevalence of PXS increases with age and the risk of high IOP and glaucoma in patients with PXS is more than those without PXS and PXS is an important risk factor for glaucoma or elevated intraocular pressure. Doing multi center studies in different states and Ardabil province in order to identify the exact prevalence of PXS and its role in elevated intraocular pressure is suggested in future..

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REFERENCES

1. Govetto A, Lorente R, Vázquez de Parga P, Rojas L, Moreno C et al. Frequency of pseudoexfoliation among patients scheduled for cataract surgery. J Cataract Refract Surg. 2015;41(6):1224-31.
2. Shazly TA, Farrag AN, Kamel A, Al-Hussaini AK. Prevalence of Pseudoexfoliation Syndrome and Pseudoexfoliation Glaucoma in Upper Egypt. BMC Ophthalmol. 2011;11:18.
3. Kozobolis VP, Papatzanaki M, Vlachonikolis IG, Pallikaris IG, Tsambarlakis IG. Epidemiology of pseudoexfoliation in the island of Crete (Greece). Acta Ophthalmol Scand. 1997;75:726-9.
4. Moreno Montane J, Alcolea Paredes A, Campos Garcia S. Prevalence of pseudoexfoliation syndrome in the north-west of Spain. Acta Ophthalmol. 1989;67(4):383-5.
5. Krishnadas R, Nirmalan PK, Ramakrishnan R, Thulasiraj RD, Katz J, Tielsch JM, et al. Pseudoexfoliation in a rural population of southern India: The Aravind Comprehensive Eye Survey. Amer J Ophtha. 2003;13516:830-7.
6. Miyazaki M, Kubota T, Kubo M, Kiyohara Y, Iida M, Nose Y, et al. The prevalence of pseudoexfoliation syndrome in a Japanese population: The Hisayama Study. J Glau. 2005;14(6):482-4.
7. Mahdavi KN, Nosrat N, Sahebghalam R, Jahanmard M. Pseudoexfoliation syndrome in cataract, Iran: A population based survey: Acta ophthalmol. Scand. 1999;77:581-584.
8. Young AL, Tang WW, Lam DS. The prevalence of pseudoexfoliation syndrome in Chinese people. Br J Ophthalmol. 2004;88:193-5.
9. Arvind H, Raju P, Paul PG, Baskaran M, Ramesh SV, George RJ, et al. Pseudoexfoliation in south India. Br J Ophthalmol. 2003;87:1321-3.
10. Rao RQ, Arain TM, Ahmad MA. The Prevalence of Pseudoexfoliation Syndrome in Pakistan. BMC Ophthalmol. 2006;6:27-30.
11. Kaljurand K, Puska P. Exfoliation syndrome in Estonian patients scheduled for cataract surgery. Acta Ophthalmol Scand. 2004;82:259-63.
12. Thomas R, Nirmalan PK, Krishnaiah S. Pseudoexfoliation in southern India: The Andhra Pradesh Eye Disease Study. Invest Ophthalmol Vis Sci. 2005;46(4):1170-6.
13. Susic N, Brakovic J. The prevalence of pseudoexfoliation syndrome (PXS) in patients admitted for cataract surgery to the department of ophthalmology, Sibenik general hospital. Acta Med Croatica. 2006;60(2):121-4.
14. Astrom S, Linden C. Incidence and prevalence of pseudoexfoliation and open-angle glaucoma in northern Sweden: I. Baseline report. Acta Ophthalmol Scand. 2007;85(8):828-31.
15. Junejo SA, Jatoi SM, Khan NA, Qureshi MA. To determine prevalence of Pseudo exfoliation at a Tertiary Eye Care Centre: A Hospital based study. Pak J Med Sci. 2008;24(6):821-6.
16. Andrikopoulos GK, Mela EK, Georgakopoulos CD, Papadopoulos GE, Damelou AN, Alexopoulos DK, et al. Pseudoexfoliation syndrome prevalence in Greek patients with cataract and its association to glaucoma and coronary artery disease. Eye. 2009;23:442-7.
17. Arnarsson A, Damji KF, Sasaki H, Sverrisson T, Jonasson F. Pseudoexfoliation in the Rekjavik eye study. Am J Ophthalmol. 2009;148:291-7.

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